

BLUE

Dart Aerospace Ltd.

Date: Friday, 19/12/2008 2:56:42 PM  
 User: Julie Dawson

## Process Sheet

<b>Customer</b> :	CU-DAR001 Dart Helicopters Services	<b>Drawing Name</b> :	206L AFT X-TUBE
<b>Job Number</b> :	44214		
<b>Estimate Number</b> :	10973		
<b>P.O. Number</b> :		<b>Part Number</b> :	D206667203BL
<b>This Issue</b> :	19/12/2008	<b>S.O. No.</b> :	
<b>Prsht Rev.</b> :	NC	<b>Drawing Number</b> :	D206-667-243 REV 3
<b>First Issue</b> :	19/12/2008	<b>Project Number</b> :	N/A
<b>Previous Run</b> :	43494	<b>Drawing Revision</b> :	
	<b>Type</b> :	<b>Material</b> :	
	CROSSTUBES	<b>Due Date</b> :	02/02/2009
<b>Written By</b> :		<b>Qty:</b>	1
<b>Checked &amp; Approved By</b> :	JW 08.12.19	<b>Um:</b>	Each
<b>Comment</b> :	Est Rev:F 05.09.01 Add holes for compatibility with Bell Skidtubes KJ/JLM Est Rev:G 08-06-03 update as per DSI9415 (ECN1198) DD verified by:ec Est Rev:H 08-07-18 remove thread masking in step 12 DD verified by:EC		

## Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
---------	-----------------------	---------------

1.0	DC	DOCUMENT CONTROL
-----	----	------------------



Comment: DOCUMENT CONTROL

Photocopy bluefile and create labels as per PPP D206-667-203 CHG003

2.0	D206667203TRN	Crosstube Turning Detail
-----	---------------	--------------------------



Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)

CROSSTUBE TURNING DETAIL

batch B-43051

3.0	BENDING	BENDING MACHINE - SKIDTUBES
-----	---------	-----------------------------



Comment: BENDING MACHINE

Bend tube as per Dwg D206-667-243 using CNC bender program 206L-AF and Folio FT

4.0	QC15	DIMENSIONAL CHECK OF X-TUBES
-----	------	------------------------------



Comment: DIMENSIONAL CHECK OF X-TUBES

5.0	CROSSTUBES	CROSSTUBES RESOURCE 1
-----	------------	-----------------------



Comment: LANDING GEAR RESOURCE 1

1-Drill pilot holes in tube using drill Jig DT8583 &amp; DT8584 as per Dwg D206-667-243. Drill all (3) top holes.

2-Drill and Ream all holes in tube to finish size using drill Jig DT8583 &amp; DT8584 as per Dwg D206-667-243

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Friday, 19/12/2008 2:56:42 PM  
User: Julie Dawson

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 206L AFT X-TUBE

Job Number: 44214

Part Number: D206667203BL

Job Number:



Seq. #:

Machine Or Operation:

Description :

Check dimensions between holes on all four sides.

3-Flip tube and switch drilling Jigs from right to left, left to right. Locate Jigs off existing holes using "T" pins.

4-Drill pilot holes using drill Jig DT8583 & DT8584 as per Dwg D206-667-243. Drill only the top (2) holes.

5-Drill & ream the top (2) holes to finish size using drill Jig DT8583 & DT8584 as per Dwg D206-667-243

6-Drill Fwd rivet holes using drill Jig DT8789FWD as per Dwg D206-667-143. Note: Fwd side has 3x top holes.

7-Drill Aft rivet holes using drill Jig DT8789 as per Dwg D206-667-243.

8-C'sink holes as per Dwg D206-667-243.

9-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D206-667-243

10-Scribe part # and batch # using vibrating stylus as per Dwg D206-667-243  
Inside of Cuff(Donot engrave on outside of tube)

MB  
09-01-07

MB 09-01-07

MB 09-01-07

6.0 HAND FINISHING1

HAND FINISHING RESOURCE #1



MB 09-01-07



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

7.0 QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

509/1/08 (10)

8.0 QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

509/1/08 (10)

9.0 OUTSIDE SERV.11

OUTSIDE SERVICE -CROSSTUBES



P.O. 8/100

11 09-01-19



Comment: Sub-Contracting OUTSIDE SERVICE -CROSSTUBES

10.0 PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Inspect for transit damage

Ensure copy of NDT results attached to work order.

10 9/01/19 (10)

10.1 Purchasing

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

Date: Friday, 19/12/2008 2:56:42 PM  
User: Julie Dawson

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 206L AFT X-TUBE

Job Number: 44214

Part Number: D206667203BL

Job Number:



Seq. #:

Machine Or Operation:

Description :

11.0

Q00

DIMENSIONAL CHECK

205



ml 09 01 19



①

Comment: Inspect for damage & ensure results are as per Dwg D206-667-103

12.0

SPRAY PAINTING

SPRAY PAINTING



Comment: SPRAY PAINTING

1-Prime inside and outside crosstube as per QSI 005 4.2 - GREY

RT 09-01-29

2-

-PAINT DELFLEET BLUE

-CLEAR DELFLEET

13.0

QC14

INSPECT SPRAY PAINT



09-01-30 ①



Comment: Inspect Spray Paint

Wrap in plastic bag to protect from scratches

14.0

D2873045

Nut Plate Assembly



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Pick:

Qty Part number

Description Batch

2 D2873-045

Nut Plate

43409

RT 09-01-28

15.0

D2873043

Nut Plate Assembly



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Pick:

Qty Part number

Description Batch

2 D2873-043

Nut Plate

43176<sup>x1</sup> / 43669<sup>x1</sup>

RT 09-01-28

16.0

MS20601AD4W10

RIVET



Comment: Qty.: 14.0000 Each(s)/Unit Total : 14.0000 Each(s)

Pick:

Qty Part number

Description Batch

14 MS20601AD4W10 Rivet

110219

RT 09-01-28

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

Date: Friday, 19/12/2008 2:56:42 PM  
User: Julie Dawson

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 206L AFT X-TUBE

Job Number: 44214

Part Number: D206667203BL

Job Number:



Seq. #:	Machine Or Operation:	Description :
---------	-----------------------	---------------

17.0

CROSSTUBES

CROSSTUBES RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Install nut plates as per Dwg D206-667-243.

85 09-01-28

18.0

D3595075450

RUBBER CUSHION .75" x 4.50



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)  
RUBBER CUSHION .75" x 4.50

341108

85 09 02-02

19.0

D28921

Support



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Pick:

Qty Part number Description Batch  
2 D2892-1 Support 44372

85 09-02-02

20.0

MS2192022

Clamp(per MIL-DTL-8783C)



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Pick:

Qty Part number Description Batch  
4 MS21920-22 Clamp 108187

85 09 02-02

21.0

SKIDTUBES 1

SKIDTUBESS RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Install support using 0.03" to 0.06" thick layer of magnobond 6398 per QSI 015. Let cure for 12h after installation and prior to packaging. Note: (3) top holes should be facing up.

85 09-02-02

A/R Magnobond 6398 : 109900

2-Install supports and clamps as per Dwg D206-667-243. Torque clamps to 80-100 in lb

22.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

Signature: 09-02-03

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries



Date: Friday, 19/12/2008 2:56:42 PM  
User: Julie Dawson

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 206L AFT X-TUBE

Job Number: 44214

Part Number: D206667203BL

Job Number:



Seq. #: Machine Or Operation: Description :

23.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1  
Pick Packing Kit

24.0

AN534A

Bolt



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)  
Bolt  
Batch: M108782

*Handwritten signature*

25.0

MS21042L5

Nut



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)  
Nut  
Batch: M110382

*Handwritten signature*

26.0

AN510A

Bolt



Comment: Qty.: 10.0000 Each(s)/Unit Total : 10.0000 Each(s)  
Pick:Packing Kit  
Qty Part number Description Batch  
10 AN5-10A Bolt M109702

*Handwritten signature*

27.0

AN532A

Bolt



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)  
Pick:Packing Kit  
Qty Part number Description Batch  
4 AN5-32A Bolt M110363

*Handwritten signature*

28.0

AN960JD516

Washer



Comment: Qty.: 18.0000 Each(s)/Unit Total : 18.0000 Each(s)  
Pick:Packing Kit  
Qty Part number Description Batch  
18 AN960JD516 Washer M15752

*Handwritten signature and date 9/10/3*

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

Date: Friday, 19/12/2008 2:56:42 PM  
User: Julie Dawson

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 206L AFT X-TUBE

Job Number: 44214

Part Number: D206667203BL

Job Number:



Seq. #:

Machine Or Operation:

Description :

29.0

QC4

INSPECT 100% KITS FOR COMPLETENESS



Comment: INSPECT 100% KITS FOR COMPLETENESS

09/02/04 @

30.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and pack for shipping as per PPP D206-667-203

Location: \_\_\_\_\_

PPP Rev: D

AS

09/02/04 @

31.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

09/02/05 @

Job Completion



MF 09-02-04

D206 667 203 BL B 44214

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

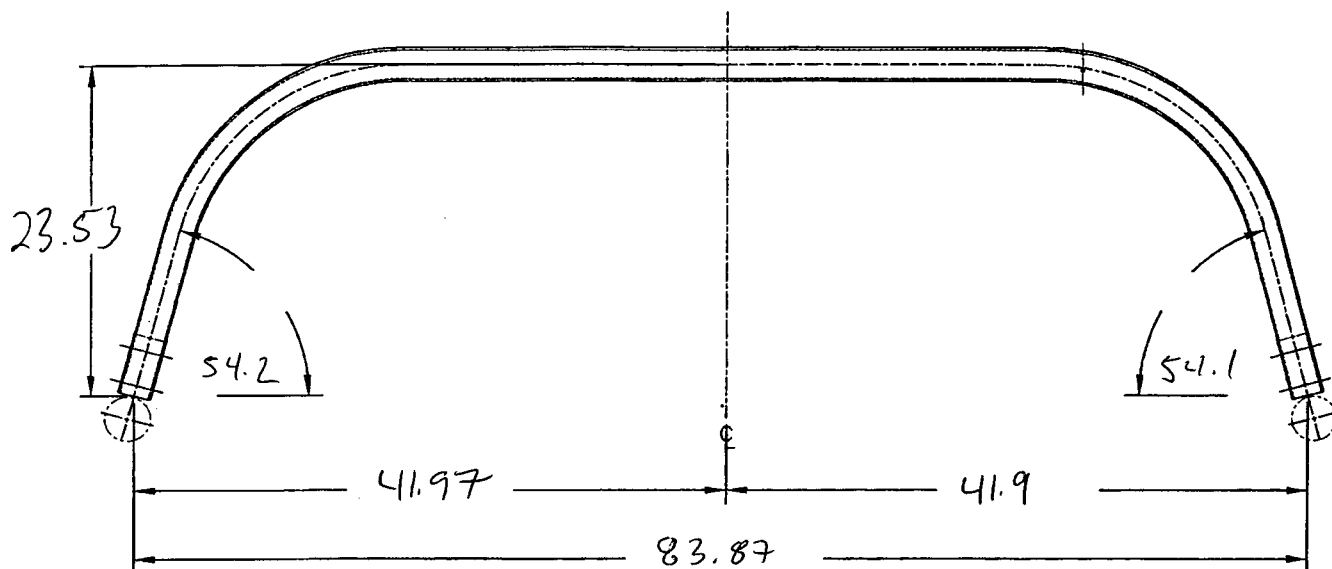
Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

<b>DART AEROSPACE LTD</b>		<b>Work Order:</b> 44214
<b>Description:</b> Crosstube High Aft (206L)		<b>Part Number:</b> D206-667-203
<b>Inspection Dwg:</b> D206-667-243 <b>Rev:</b> B		<b>Page 1 of 1</b>

Required Dimension	Min	Max
Height	23.46	23.58
1/2 Span	41.86	41.98
Angle	54	56
Total Span	83.72	83.96



Comments

QC15 Inspection	<i>[Signature]</i> 0901.06
Date	

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM <i>[Signature]</i>	<i>[Signature]</i>

Item	Qty -243	Part Number	Description
1	X	D206-667-243	CROSSTUBE ASSEMBLY (206L HIGH AFT)
2	1	D6004-115	CROSSTUBE
3	2	D2873-043	NUT PLATE
4	2	D2873-045	NUT PLATE
5	2	D2892-1	SUPPORT
6	4	D3595-063-450	RUBBER CUSHION
7	4	MS21920-22	CLAMP
8	14	MS20601AD4W10	RIVET (OR NAS9302B-4-10)
9	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299- 947-100, TYPE II, CLASS 2 ADHESIVE)

# **GENERAL NOTES:**

- 1) MATERIAL: MANUFACTURED FROM D6004-115  
FINISHED LENGTH = 104.91±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D206-667-243" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 21.9 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART WHERE INDICATED. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2892-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-22 CLAMPS WITH D3595-063-450 RUBBER CUSHIONS TO SECURE THE D2892-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMP MECHANISMS ARE LOCATED ON CROSSTUBE SUPPORTS.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHOP COPY  
RETURN TO  
ENGINEERING  
UNCONTROLLED COPY  
SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
NO. 4424

RELEASED  
08/11/06

C	REVISE GENERAL NOTES/PART LIST (ZN D7-1); REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS. D3595-063-450 WAS D2856-400-773 (ZN D6-2 & A5-2); REMOVED REF. & ADD TOLERANCES (ZN 4-3, C5-3, D3-3); RELOCATED FLAG #6 (ZN A8-3) PER NCR 210; MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4.	RF	08.11.06
B	ADD HOLES AND NUT PLATES FOR COMPATABILITY WITH BHT/AA SKUDTUBES	PH	05.07.26
A	NEW ISSUE	CP	00.11.17
REV.	DESCRIPTION	BY	DATE
DESIGN	RF	<b>DART AEROSPACE LTD</b> HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED	RF	DRAWING NO.	REV. C
MFG. APPR.	RF	D206-667-243	SHEET 1 OF 4
APPROVED	RF	TITLE	SCALE
DE APPR.	RF	CROSSTUBE ASS'Y (206L HIGH AFT)	NTS
DATE	08.11.06	<small>COPYRIGHT © 2006 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

8 7 6 5 4 3 2 1

D

D

C

C

B

B

A

A

12 D2892-1 SUPPORT  
2 PL

15 MS21920-22 CLAMP  
4 PL

C

13

D3595-063-450  
RUBBER CUSHION  
4 PL, (UNDER CLAMP)

B

B

A4-2

C

**D206-667-243**  
**ASSEMBLY DETAIL**  
(VIEW LOOKING FWD)

FWD

6°

13 15  
MS21920-22 CLAMP REF

12  
D2892-1 SUPPORT REF

C

D3595-063-450  
RUBBER CUSHION REF

D5-2 **SECTION B-B**  
SCALE 5X

A

B7-2

D206-667-603

C

B2-2

**RELEASED**  
08/11/12 MP

D2873-043  
NUT PLATE

MS20601AD4W10  
RIVET, 4 PL

SHOP COPY  
RETURN TO  
ENGINEERING  
UNCONTROLLED COPY  
SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
NO. 44214

D2873-045  
NUT PLATE

MS20601AD4W10  
RIVET, 3 PL

**VIEW C-C:**  
**CUFF DETAIL**  
SCALE 4X

90°  
REF

D2873-043  
NUT PLATE

MS20601AD4W10  
RIVET, 4 PL

D2873-045  
NUT PLATE

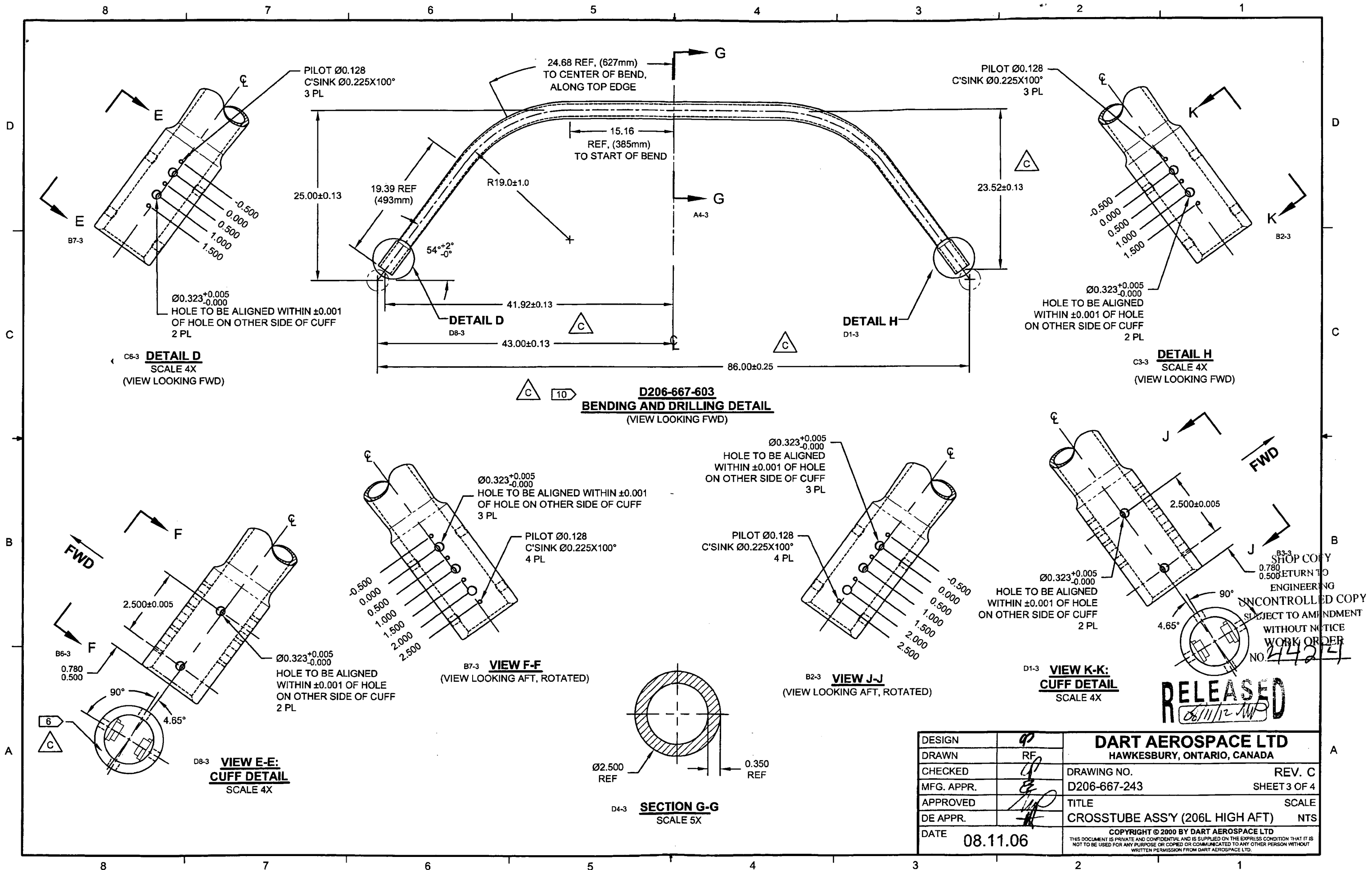
MS20601AD4W10  
RIVET, 3 PL

90°  
REF

C7-2 **VIEW A-A:**  
**CUFF DETAIL**  
SCALE 4X

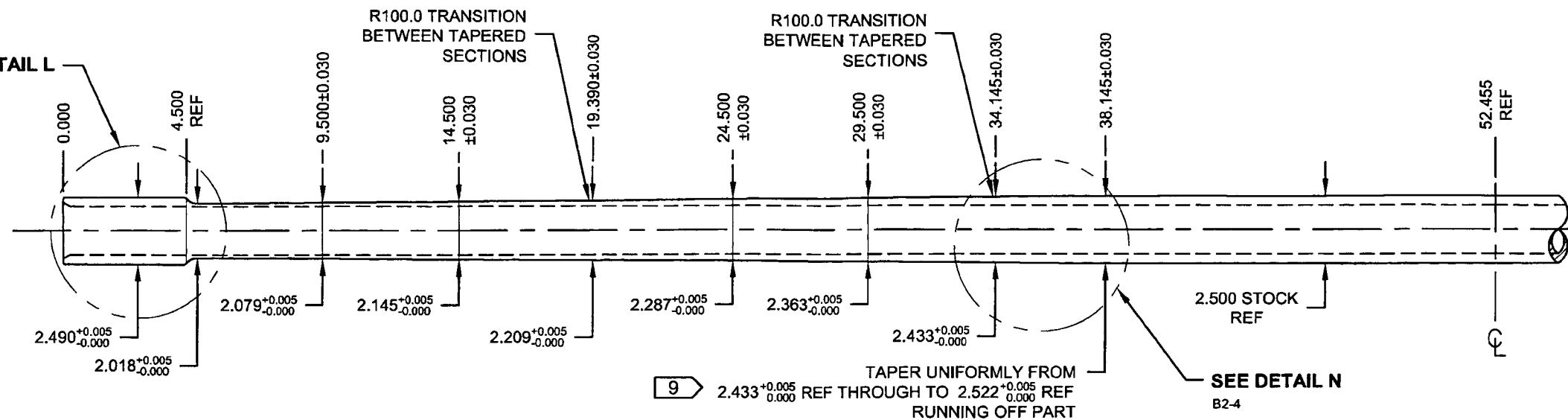
DESIGN	47	<b>DART AEROSPACE LTD</b>	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. C
MFG. APPR.		D206-667-243	SHEET 2 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE ASS'Y (206L HIGH AFT)	NTS
DATE	08.11.06	COPYRIGHT © 2000 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

8 7 6 5 4 3 2 1

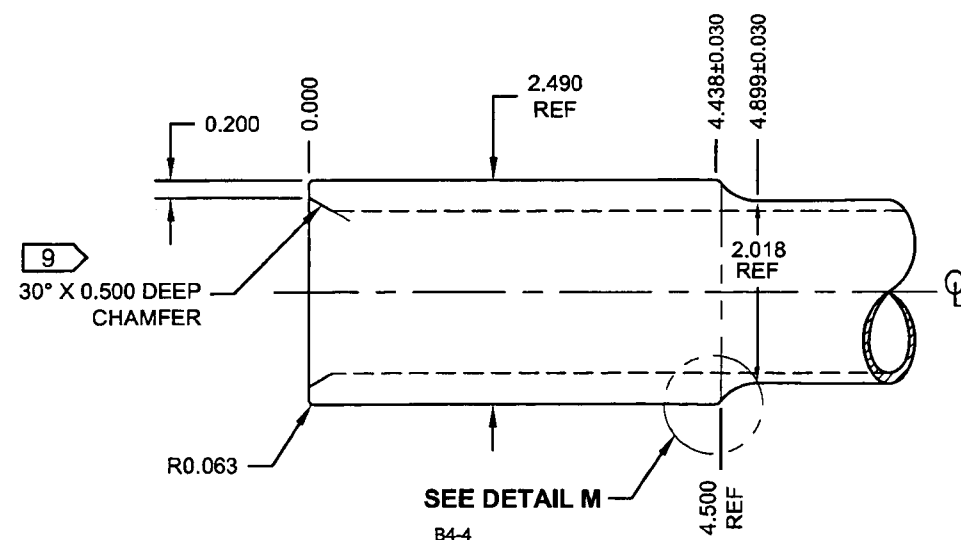




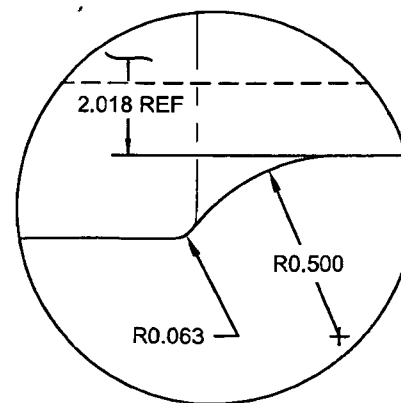
SEE DETAIL L  
B7-4



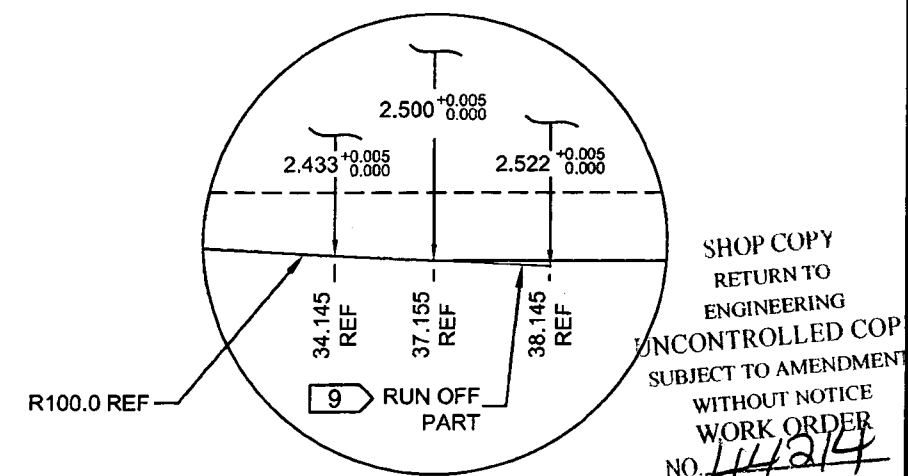
**TURNING DETAIL**



**DETAIL L: CROSSTUBE CUFF**  
NOT TO SCALE



**DETAIL M: CUFF TRANSITION**  
NOT TO SCALE



**DETAIL N: TAPER RUN-OFF**  
NOT TO SCALE

**RELEASED**  
08/11/12

DESIGN	92	<b>DART AEROSPACE LTD</b>	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	JP	DRAWING NO.	REV. C
MFG. APPR.	JP	D206-667-243	SHEET 4 OF 4
APPROVED	JP	TITLE	SCALE
DE APPR.	JP	CROSSTUBE ASS'Y (206L HIGH AFT)	NTS
DATE	08.11.06	<small>COPYRIGHT © 2000 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	





# LIQUID PENETRANT TEST REPORT

P- 149

PAGE 1 OF 1

CLIENT DART AEROSPACE DATE JAN 16-2009 TIME AM ☐ PM ☐  
ATTENTION LINDA LAELLE ACUREN JOB No. 188-09-001278  
ADDRESS 1270 ABERDEEN ST POWO No. 8000  
HAWKES BURY ONT WORK LOCATION MAIN SHOP-HAWKES  
ACCEPTANCE STD. ASTM1417 REV./DATE 200  
PROJECT X-TUBES QSI-038  
ITEM(S) EXAMINED 7 ITEMS. FLUORESCENT DIE

JOB DESCRIPTION PROCEDURE No. LT-XXX REV./DATE TECHNIQUE No. LT-XXX REV./DATE  
PART NO. MATERIAL ALODINED ALUM. THICKNESS  
SCOPE WET FLUORESCENT LIQUID PENETRANT INSPECTION  
CARRIED OUT ON 100% EXTERNAL

TEST DETAILS  
METHOD ☒ FLUORESCENT ☐ VISIBLE ☒ WATER WASH ☐ SOLVENT REMOVABLE ☐ POST EM  
FAMILY BRAND MAGNAFLUX BLACK LIGHT S/N 8171 ☐ OUTPUT > 1000  $\mu$ W/cm<sup>2</sup> ☐ AMBIENT  
PENETRANT Z107 MINIMUM DWELL TIME 45 MIN. LIGHTING EQUIP. ☐ FLASHLIGHT ☐ TROUBLELIGHT ☐ OUTPUT > 100 fc @  
PENETRANT REMOVER H2O MINIMUM DRY TIME >10 MIN. OTHER  
DEVELOPER SK052 MINIMUM DWELL TIME 10 MIN. LIGHT METER S/N CAL DUE DATE FES  
DEVELOPER TYPE ☒ NON AQUEOUS ☐ AQUEOUS ☐ DRY

TEST SURFACE  
SURFACE CONDITION ☐ AS GROUND ☐ AS WELDED ☐ MACHINED ☐ SHOT BLASTED ☒ CLEAN BARE ME  
SURFACE TEMPERATURE ☐ < -4°C/ 20°F ☐ -4°C/ 20°F TO 10°C/50°F ☐ 10°C/50°F TO 52°C/125°F ☐ > 52°C/125°F

RESULTS- (☐ METRIC ☐ IMPERIAL)  
PART IDENTIFICATION  
1 - B-44125-443052 SC 1 44215  
1 - B-44156-44193 ☒  
1 - B-44155-44192 ☒  
1 - B-44378-44139 ☒  
1 - B-44379-44140 ☒  
1 - B-43330-44384 ☒  
1 - B-43051-44214 ☒  
NO INDICATION WAS LOCATED ON THIS PIECE. WILL BE SANDED TO COMFIRM, AND REEXAMINED AT LATER DATE  
1/09/09

## Scope of Services

The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

## Standard of Care

In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed, implied, is made or intended by Acuren Group Inc.

## SIGNATURES

CLIENT REPRESENTATIVE Julie Dawson DTR # 19804  
TECHNICIAN (SIGNATURE): Mike Johnston REPORT REVIEWED BY:  
NAME (PRINT): Mike Johnston NAME INIT  
1<sup>st</sup> TECHNICIAN 2<sup>nd</sup> TECHNICIAN  
CGSB LEVEL II SNT LEVEL CGSB LEVEL SNT LEVEL  
CGSB REG. No 0666 CGSB REG. No

WHITE - CLIENT COPY

CANARY - OFFICE COPY

PINK - TECHNICIAN COPY

GOLD - OFFICE COPY

PTS

Client:

Client:

**Contact:**

**Location:**

**Description:**

Report #'s:

## Daily Time Report

E- 19804

Form dated Sep 2005

۱۰۰

Job #: 188-04-001278

Day: Sun Mon Tues

P.O. #:

Vehicle #

Date: JAN-16-2009

Wed      Thurs      Fri      Sat

W.O #: 188-09-001278

Camera #:

[illegible]

## RADIOGRAPHIC UNIT PRICING

						<b>RADIOGRAPHIC UNIT PRICING</b>															
Weld Diameter												Long Seam					Circ. Seam				
Schedule / Thickness												Thickness					Thickness				
Quantity												Lineal Ft.					Lineal Ft.				

Film:

**Film:**

Pcs. 2 3/4 x 17"

Pcs. 3 1/2 x 17"

Pcs. 4 1/2 x 17"

Pcs. 14" x 17"

Pcs.

Consumables:

Equipment:

Client Representative:

WET FLUORESCENT.  
AS PER -

Place a check mark in each safety check area as completed	
C/C	CAMERA CHECK
S/E	SAFETY EQUIPMENT CHECK
S/C	SURVEY METER CHECK
B/S	BARRIER & SIGN INSTALLED
C/L	CAMERA LOCKED & SECURELY STORED
C/S	CAMERA SURVEYED AFTER EACH USE

## EXPENSES

## NOTES

<b>Oakville</b>	(905) 825-8595 • Fax (905) 825-8598
<b>Sarnia</b>	(519) 336-3021 • Fax: (519) 336-8220
<b>Sudbury</b>	(705) 522-1849 • Fax (705) 522-9926
<b>Halifax</b>	(902) 497-3870 • Fax (902) 445-5090
<b>North Bay</b>	(705) 840-8107 • Fax (705) 476-6683
<b>Val D'Or</b>	(819) 856-6789 • Fax (819) 825-9564

**ACUREN 1-877-299-2857**

<b>Cambridge</b>	(519) 622-3112 • Fax (519) 622-1326
<b>Cornwall</b>	(613) 931-1261 • Fax (613) 931-2777
<b>Saint John</b>	(506) 847-0194 • Fax (506) 847-0194
<b>Thunder Bay</b>	(807) 475-4240 • Fax (807) 577-2017
<b>Gaspé</b>	(418) 392-3618 • Fax (418) 392-4114
<b>Hull</b>	(819) 360-0685 • Fax (819) 827-3513



# LIQUID PENETRANT TEST REPORT

P- 14931

PAGE 1 OF 1

CLIENT DART AEROSPACE DATE JAN-20-2009 TIME AM ☒ PM ☐  
ATTENTION LINDA ACUREN JOB NO. 188-08/001282  
ADDRESS 1270 ABERDEEN ST PO/WO NO. 8085  
HAWKES BURY, ONT. K6A-1K7 WORK LOCATION MAIN SHOP - HAWKESBURY  
ACCEPTANCE STD. ASTM 1417 REV./DATE 2007  
PROJECT F.P.I ON MACHINED PARTS AND CROSS TUBES.  
ITEM(S) EXAMINED 42 MACHINED PIECES.  
3 CROSSTUBES 100% EXTERNAL AND ONE CROSSTUBE REEXAMINE

JOB DESCRIPTION \_\_\_\_\_ PROCEDURE NO. LT-XXXX REV./DATE \_\_\_\_\_ TECHNIQUE NO. LT-XXXX-XXX REV./DATE \_\_\_\_\_  
PART NO. \_\_\_\_\_ MATERIAL MACHINED ALUM THICKNESS \_\_\_\_\_  
SCOPE WET FLUORESCENT LIQUID PENETRANT INSPECTION  
CARRIED OUT ON 100% EXTERNAL.

TEST DETAILS  
METHOD ☒ FLUORESCENT ☐ VISIBLE ☒ WATER WASH ☐ SOLVENT REMOVABLE ☐ POST EMULSIFIED  
FAMILY BRAND MAGNAFLUX BLACK LIGHT S/N 8171 ☐ OUTPUT > 1000  $\mu$ W/cm<sup>2</sup> ☐ AMBIENT < 2 fc  
PENETRANT 2L 67 MINIMUM DWELL TIME 45 MIN. LIGHTING EQUIP. ☐ FLASHLIGHT ☐ TROUBLELIGHT ☐ OUTPUT > 100 fc @ SURFACE  
PENETRANT REMOVER H2O MINIMUM DRY TIME >10 MIN. OTHER \_\_\_\_\_  
DEVELOPER SKD 52 MINIMUM DWELL TIME 10 MIN. LIGHT METER S/N \_\_\_\_\_ CAL DUE DATE FEB-09  
DEVELOPER TYPE ☒ NON AQUEOUS ☐ AQUEOUS ☐ DRY

TEST SURFACE  
SURFACE CONDITION ☐ AS GROUND ☐ AS WELDED ☐ MACHINED ☐ SHOT BLASTED ☒ CLEAN BARE METAL  
SURFACE TEMPERATURE ☐ < - 4°C/ 20°F ☐ - 4°C/ 20°F TO 10°C/50°F ☐ 10°C/50°F TO 52°C/125°F ☐ > 52°C/125°F

RESULTS- ( <input type="checkbox"/> METRIC <input type="checkbox"/> IMPERIAL)		ACCEPT	REJECT
ITEM	COMMENTS		
1	<u>JB# 44214</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1	<u>45006</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1	<u>44215</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1	<u>44944</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	<u>45299</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
10	<u>44824</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6	<u>44087</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	<u>45297</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
10	<u>44823</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6	<u>44686</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6	<u>44685</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>ALL ITEMS FOUND</u>			
<u>ACCEPTABLE FOR JOB# 188-08/001282</u>			

Scope of Services  
The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.  
Standard of Care  
In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

SIGNATURES  
CLIENT REPRESENTATIVE Micetha M. M. M. DTR # \_\_\_\_\_  
TECHNICIAN (SIGNATURE): Mike Johnston REPORT REVIEWED BY: \_\_\_\_\_  
NAME (PRINT): Mike Johnston NAME \_\_\_\_\_ INITIALS \_\_\_\_\_  
1<sup>ST</sup> TECHNICIAN CGSB LEVEL II SNT LEVEL \_\_\_\_\_ CGSB REG. NO. 6066 2<sup>ND</sup> TECHNICIAN CGSB LEVEL \_\_\_\_\_ SNT LEVEL \_\_\_\_\_ CGSB REG. NO. \_\_\_\_\_